Claims:

1. An article for inhibiting the growth of microbes in biological and physiological fluids, said article having a support structure and comprising derivatized particles having an attached metal-ion sequestrant for inhibiting the growth of said microbes, wherein the derivatized particles have a stability constant greater than 10^{10} with iron (III).

2. An article according to claim 1 wherein said support structure is made of fibers, fabric, textiles, plastic or paper.

3. An article according to claim 1 wherein said derivatized particles are immobilized on the support structure and have a high–affinity for biologically important metal-ions such as Mn, Zn, Cu and Fe.

4. An article according to claim 1 wherein said derivatized particles are immobilized on the support structure and have a high–selectivity for biologically important metal-ions such as Mn, Zn, Cu and Fe.

5. An article according to claim 1 wherein said derivatized particles are immobilized on the support structure and have a stability constant greater than 10^{20} with iron (III).

6. An article according to claim 1 wherein said derivatized particles are immobilized on the support structure and have a stability constant greater than 10^{30} with iron (III).

7. An article according to claim 1 wherein said derivatized particles comprise derivatized nanoparticles comprising inorganic nanoparticles having an attached metal-ion sequestrant, wherein said inorganic nanoparticles have an average particle size of less than 200 nm and the derivatized nanoparticles have a stability constant greater than 10^{10} with iron (III).

8. An article according to claim 7 wherein derivatized nanoparticles comprise inorganic nanoparticles having an attached metal-ion sequestrant, wherein said inorganic nanoparticles have an average particle size of less than 200 nm and the derivatized nanoparticles have a stability constant greater than 10^{20} with iron (III).

9. An article according to claim 7 wherein said inorganic nanoparticles comprise silica oxides, alumina oxides, boehmites, titanium oxides, zinc oxides, tin oxides, zirconium oxides, yttrium oxides, hafnium oxides, clays, and alumina silicates.

10. An article according to claim 1 wherein said metal-ion sequestrant comprises an alpha amino carboxylate, a hydroxamate, or a catechol functional group.

11. An article according to claim 1 wherein the metal-ion sequestrant is attached to the particle, by reacting the particle with a metal alkoxide intermediate of the sequestrant having the general formula:

$M(OR)_{4-x} R'_x$;

wherein M is silicon, titanium, aluminum, tin, or germanium;
x is an integer from 1 to 3;
R is an organic group; and
R' is an organic group containing an alpha amino carboxylate, a hydroxamate, or a catechol.

12. An article according to claim 1 wherein said metal-ion sequestrant is attached to the particle by reacting the particle with a silicon alkoxide intermediate of the sequestrant having the general formula:

$Si(OR)_{4-x} R'_x$;

wherein x is an integer from 1 to 3;
R is an alkyl group; and
R' is an organic group containing an alpha amino carboxylate, a hydroxamate, or a catechol.

13. An article according to claim 1 further comprising a polymer, or polymeric layer containing said derivatized particles.

14. An article according to claim 13 wherein the polymer is permeable to water.

15. An article according to claim 13 wherein the polymer comprises one or more of polyvinyl alcohol, cellophane, water-based polyurethanes, polyester, nylon, high nitrile resins, polyethylene-polyvinyl alcohol copolymer, polystyrene, ethyl cellulose, cellulose acetate, cellulose nitrate, aqueous latexes, polyacrylic acid, polystyrene sulfonate , polyamide, polymethacrylate, polyethylene terephthalate, polystyrene, polyethylene and polypropylene or polyacrylonitrile.

16. An article according to claim 7 wherein said inorganic nanoparticles have a specific surface area of greater than 100 m^2/g.

17. An article according to claim 13 further comprising a barrier layer wherein the polymeric layer is between the surface of the article and the barrier layer and wherein the barrier layer does not contain the derivatized nanoparticles.

18. An article according to claim 17 wherein the barrier layer is permeable to water.

19. An article according to claim 17 wherein the barrier layer has a thickness in the range of 0.1 microns to 10.0 microns.

20. An article according to claim 17 wherein the barrier layer comprises one or more of polyvinyl alcohol, cellophane, water-based polyurethanes, polyester, nylon, high nitrile resins, polyethylene-polyvinyl alcohol copolymer, polystyrene, ethyl cellulose, cellulose acetate, cellulose nitrate, aqueous latexes, polyacrylic acid, polystyrene sulfonate , polyamide, polymethacrylate, polyethylene terephthalate, polystyrene, polyethylene and polypropylene or polyacrylonitrile.

21 An article according to claim 17 wherein microbes cannot pass or diffuse through the barrier layer.

22. An article according to claim 1 where said article is designed to be placed against the skin of an individual.

23. An article according to claim 22 wherein said article comprises a bandage.

24. An article according to claim 23 wherein said bandage includes a liquid permeable barrier layer for allowing said biological or physiological fluids to come in contact with said derivatized particles.

25. An article according to claim 1 wherein said article comprises a diaper.

26. An article according to claim 25 wherein said diaper includes a liquid permeable membrane for allowing said nutrient to come in contact with said derivatized particles.

27. An article according to claim 1 wherein said article is designed to be placed within a living animal.

28. An article according to claim 1 wherein said article is designed to be placed within an individual.

29. An article according to claim 28 wherein said article comprises a tampon.

30. An article according to claim 28 wherein said article comprises a gauze.

31. A method for inhibiting growth of microbes in biological and physiological fluids, comprising the steps of;

a. providing an article having a support structure and derivatized particles having an attached metal-ion sequestrant for inhibiting the growth of said microbes, wherein the derivatized particles have a stability constant greater than 10^{10} with iron (III); and

b. placing said article in contact with said biological and/or said physiological fluid so that the growth of microbes is inhibited in said biological and/or said physiological fluid.

32. A method according to claim 31 wherein said support structure is made of fibers, fabric, textiles, plastic or paper.

33. A method according to claim 31 wherein said derivatized particles are immobilized on the support structure and have a high–affinity for biologically important metal-ions such as Mn, Zn, Cu and Fe.

34. A method according to claim 31 wherein said derivatized particles are immobilized on the support structure and have a high–selectivity for biologically important metal-ions such as Mn, Zn, Cu and Fe.

35. A method according to claim 31 wherein said derivatized particles are immobilized on the support structure and have a stability constant greater than 10^{20} with iron (III).

36. A method according to claim 31 wherein said derivatized particles are immobilized on the support structure and have a stability constant greater than 10^{30} with iron (III).

37. A method according to claim 31 wherein said derivatized particles comprise derivatized nanoparticles comprising inorganic nanoparticles having an attached metal-ion sequestrant, wherein said inorganic nanoparticles have an average particle size of less than 200 nm and the derivatized nanoparticles have a stability constant greater than 10^{10} with iron (III).

38. A method according to claim 37 wherein derivatized nanoparticles comprise inorganic nanoparticles having an attached metal-ion sequestrant, wherein said inorganic nanoparticles have an average particle size of less than 200 nm and the derivatized nanoparticles have a stability constant greater than 10^{20} with iron (III).

39. A method according to claim 37 wherein said inorganic nanoparticles comprise silica oxides, alumina oxides, boehmites, titanium oxides, zinc oxides, tin oxides, zirconium oxides, yttrium oxides, hafnium oxides, clays, and alumina silicates.

40. A method according to claim 31 wherein said metal-ion sequestrant comprises an alpha amino carboxylate, a hydroxamate, or a catechol functional group.

41. A method according to claim 31 wherein the metal-ion sequestrant is attached to the particle, by reacting the particle with a metal alkoxide intermediate of the sequestrant having the general formula:

$M(OR)_{4-x} R'_x$;

wherein M is silicon, titanium, aluminum, tin, or germanium;
x is an integer from 1 to 3;
R is an organic group; and
R' is an organic group containing an alpha amino carboxylate, a hydroxamate, or a catechol.

42. A method according to claim 31 wherein said metal-ion sequestrant is attached to the particle by reacting the particle with a silicon alkoxide intermediate of the sequestrant having the general formula:

$Si(OR)_{4-x} R'_x$;

wherein x is an integer from 1 to 3;
R is an alkyl group; and
R' is an organic group containing an alpha amino carboxylate, a hydroxamate, or a catechol.

43. A method according to claim 31 wherein the article is replaced after a predetermined time period.

44. A method according to claim 31 wherein said support structure further comprises a polymeric layer containing said derivatized particles.

45. A method according to claim 31 where said article is designed to be placed against the skin of an individual.

46. A method according to claim 45 wherein said article comprises a bandage.

47. A method according to claim 46 wherein said bandage included a liquid permeable barrier layer for allowing said biological or physiological fluids to come in contact with said derivatized particles.

48. A method according to claim 31 wherein said article comprises a diaper.

49. A method according to claim 48 wherein said diaper includes a liquid permeable member for allowing said biological or physiological fluids to come in contact with said derivatized particles.

50. A method according to claim 31 wherein said article is designed to be placed within a living animal.

51. A method according to claim 31 wherein said article is designed to be placed within an individual.

52. A method according to claim 51 wherein said article comprises a tampon.

53. A method according to claim 51 wherein said article comprises a gauze.